# TRANSLATION PATENT COOPERATION TREATY POT

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

A1:							
Applicant's or agent's file reference P803324/WO/1	FOR FURTHER ACTION	See Form PCT/IPEA/416					
International application No.	International filing date (day/month/yea	r) Priority date (day/month/year)					
PCT/DE2004/002572	20.11.2004	18.12.2003					
International Patent Classification (IPC) or n	ational classification and IPC						
F01D15/10, F02C7/268, F02C3/113							
Applicant							
MTU AERO ENGINES GM	ВН						
-	the applicant according to Article 36.	y this International Preliminary Examining Authority					
2. This REPORT consists of a total of	f 6 sheets, in	ncluding this cover sheet.					
<ol><li>This report is also accompanied by</li></ol>	ANNEXES, comprising:						
a. (sent to the applicant a	nd to the International Bureau) a total of	2 sheets, as follows:					
sheets of the desc	ription, claims and/or drawings which have	been amended and are the basis for this report and/or					
sheets containing Instructions).	rectifications authorized by this Authority	(see Rule 70.16 and Section 607 of the Administrative					
the disclosure in	sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental						
Box.							
b (sent to the Internation	al Bureau only) a total of (indicate type and	number of electronic carrier(s))					
		, containing a sequence listing and/or tables					
	related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).						
4. This report contains indications rel	ating to the following items:						
Box No. I Basis of t	he report						
Box No. II Priority							
Box No. III Non-esta	blishment of opinion with regard to novelty	, inventive step and industrial applicability					
Box No. IV Lack of t	unity of invention						
DON THE !		to novelty, inventive step or industrial applicability;					
	citations and explanations supporting such statement						
	ocuments cited						
Box No. VII Certain d	Box No. VII Certain defects in the international application						
Box No. VIII Certain observations on the international application							
Date of submission of the demand	Date of completion	on of this report					
Name and mailing address of the IPEA/EP	Authorized office	r					
Facsimile No.	Telephone No.						

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International application No.
PCT/DE2004/002572

Box	k No. I		Basis of the report		
1.			to the language, this report is based on the international der this item.	nal application in the language in	which it was filed, unless otherwise
			eport is based on translations from the original langua		,
			international search (Rule 12.3 and 23.1(b))	Notes of	
			publication of the international application (Rule 12.4	)	
			international preliminary examination (Rule 55.2 and	or 55.3)	
2.	recei		to the <b>elements</b> of the international application, this ffice in response to an invitation under Article 14 and		
		the int	ternational application as originally filed/furnished		
	$\boxtimes$	the de	escription:		
		pages	1-8		as originally filed/furnished
		pages	*	received by this Authority on	
		pages	*	received by this Authority on	
	$\boxtimes$	the cla	aims:		
		nos.			as originally filed/furnished
		nos.*		as amended (togethe	er with any statement) under Article 19
		nos.*	1-9	received by this Authority on	18.10.2005 with telefax
		nos.*		received by this Authority on	
	$\boxtimes$	the dr	awings:		
		sheets	1/3-3/3		as originally filed/furnished
		sheets	*	received by this Authority on	
		sheets	*	received by this Authority on	
		a sequ	nence listing and/or any related table(s) – see Supplem		
3.	П	The a	mendments have resulted in the cancellation of:		
			the description, pages		
			the claims, nos.		
			41 - 4		
4.		This r	report has been established as if (some of) the amend	lments annexed to this report and	d listed below had not been made, since
		$\Box$	nave been considered to go beyond the disclosure as fi		
			the description, pages		
			the claims, nos.		
			the sequence listing (specify):		
-1-	701		any table(s) related to sequence listing (specify):	J. J. "	
*	if ite	m 4 apj	plies, some or all of those sheets may be marked "sup	етѕеиеа.	

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Box			ticle 35(2) with regard to novelty, inventive step or industrial applicability;	
1.	Statement	•		
	Novelty (N)	Claims	1-9	_ YES
		Claims		_ NO
	Inventive step (IS)	Claims	1-9	_ YES
		Claims		_ NO
	Industrial applicability (IA)	Claims	1-9	_ YES
		Claims		_ NO
2.	Citations and explanations (Rule	70.7)		

- This report makes reference to the following documents:
  - D1: PROVOST M J ED INSTITUTE OF
    ELECTRICAL AND ELECTRONICS ENGINEERS:
    "The more electric aero-engine: a
    general overview from an engine
    manufacturer" PROCEEDINGS OF THE 14TH.
    INTERNATIONAL SYMPOSIUM ON POWER
    SEMICONDUCTOR DEVICES & ICS. ISPSD'02.
    SANTA FE, NM, JUNE 4 7, 2002,
    INTERNATIONAL SYMPOSIUM ON POWER
    SEMICONDUCTOR DEVICES & IC'S, NEW YORK,
    NY: IEEE, US, 4 June 2002 (2002-0604), pages 246-251, XP010602915 ISBN:
    0-7803-7318-9
- 2. D1 is regarded as the prior art closest to the subject matter of claim 1. It discloses an aircraft engine that implicitly always has at least one stator, at least one rotor and at least one generator for generating electrical energy, a rotor implicitly having

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

a rotor shaft and rotor discs that are driven by the rotor shaft and have rotating impeller blades, a stator implicitly having a housing and stationary guide blades, a generator implicitly having at least one stator and at least one rotor, and the electrical energy generated by the generator preferably being used to operate at least one attachment device or an ancillary unit of the gas turbine (this is found in all conventional aircraft gas turbines).

D1 also discloses the concept of the "More Electric Engine", which has been known for a decade and studied by all large engine manufacturers, and in which magnetic bearings are used for bearing, as generators and as starter motors. Of course, these are necessarily integrated into the interior of the gas turbine in such a manner that the generator rotor is associated with the rotor, and the generator stator is associated with the stator, thereby enabling the kinetic energy of the rotor from the generator to be converted into electrical energy.

The subject matter of claim 1 differs from the disclosure in D1 in that the or each generator rotor is associated with the rotor impeller blades, and pole pieces are integrated into the impeller blades or are associated with the radially outer ends of

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

the impeller blades.

Therefore, the subject matter of claim 1 is novel (PCT Article 33(2)).

The searched prior art does not contain any further suggestion of integrating the pole pieces into the impeller blades, and therefore inventive step is established (PCT Article 33(3)).

- 3. The combination of features contained in dependent claims 2-9 is neither known from nor rendered obvious by the available prior art.
- 4. The subject matter of claims 1-9 is regarded as industrially applicable.

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# Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

- Contrary to the requirements of PCT Rule
   (a) (ii), the description neither cites
   document D1 nor indicates the relevant prior
   art contained therein.
- In claim 8 of the German version, the word "that" is missing after "characterized in".